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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,175	08/21/2001	Robert L. Canella	4323US	7405

7590 10/23/2003

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EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/934,175

Applicant(s)

CANELLA, ROBERT L.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-18, 20-23 and 42-45 is/are pending in the application.
- 4a) Of the above claim(s) 42-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-18 and 20-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 19.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This action responds to the supplemental IDS filed 22 July 2003 (Paper no. 19) and the Amendment filed 22 July 2003 (Paper no. 20).

#### *Response to Amendment*

1. The amendment filed 22 July 2003 (Paper no. 20) is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the terminology “substantially planar” to describe the surfaces of the carrier substrate as added to paragraphs [0006], [0044], and [0065]. Merriam Webster’s Collegiate Dictionary, 10<sup>th</sup> edition defines the term “planar” as “of, relating to, or lying in a plane.” The term “plane” is defined geometrically as “a surface of such nature that a straight line joining two of its points lies wholly in the surface” or “a flat or level surface.” Because the substrate has openings it does not meet the definition of planar. For example, a point connecting a “seat” portion of the carrier substrate and a point at a level portion of the carrier substrate surface cannot be connected by a straight line and, therefore, do not lie in a plane. Nor is the surface flat or level, but instead has holes in it. Because there are numerous openings, the surface is not “substantially planar” either. While **portions** of the carrier substrate surface **not constituting part of the aperture** are shown in the instant figures to be planar or flat or level, the entire surface of the carrier substrate is **not** planar, by definition. Accordingly this constitutes new matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

*Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 9-18, 20-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 9, the specification does not provide support for the limitation that the substrate is “substantially planar.” The figures provided clearly show the surface to be non-planar due to the openings formed therein which occupy a large fraction of the surface. Accordingly the surface is not planar or even substantially planar. For reasons just indicated regarding the incorporation of this same limitation into the specification. Those reasons are incorporated herein in their entirety. Any reference to the surface being planar or substantially planar or bounded by a planar surface is not enabled. Only portions of the carrier substrate surface **excluding** the “apertures” are shown to be planar.

The remaining claims are rejected for depending from the above rejected claim.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9-18, 20-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "said substantially planar surface of said one-piece substrate" in lines 8-9. There is insufficient antecedent basis for this limitation in the claim. Earlier in the claim the substrate is indicated to be bounded by a first substantially planar surface. This is a hypothetical construct that is not part of the substrate itself, since it is **not** planar due to the apertures, as indicated above.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 9, 11, 12, 14-16, 18, and 20-22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,229,320 B1 (Haseyama et al., **Haseyama-1**, hereafter).

Regarding claim 9, **Haseyama-1** discloses a device for establishing electrical contact between a lead element **28** (called “solder bumps” col. 10, Fig. 15) extending from an integrated circuit **25** (called “IC” col. 10, line 31) comprising,

a one-piece substrate **31** (Fig. 7), **31A** (Fig. 14B), **31A**, **41**, **42** (Figs. 15-16) bounded by a first “substantially planar” surface and an opposing second “substantially planar” surface and having at least one conductive trace **48** (Fig. 16) configured for operably connecting said IC device **25** to at least one electrical component (e.g. **47**, Fig. 16) mounted on said one-piece substrate;

a spring contact (Figs. 21A-21B, 23A) including a base portion **71**, **72**, **73** (Figs. 24A-24C) and a contact portion **63**, said contact portion **63** comprising a resiliently compressible coil spring **63** configured to bias against and electrically contact said lead element **28** of said integrated circuit device **25** (col. 15, lines 32-53; col. 16, lines 17-25); and

an aperture **43**, **44** (called “positioning holes” col. 12, line 15; Figs. 15-16), opening onto one surface of said one-piece substrate (Figs. 15-16) and extending a depth at least partially into said one-piece substrate, said aperture **44** configured to receive and electrically contact (by item **46** in Fig. 16, called “through hole electrodes,” at col. 12, lines 45-47; or item **70** in Figs. 24A-24C) said base portion **71**, **72**, **73** of said spring contact,

wherein the aperture includes

a seat portion **53A** (Fig. 14B called a “bump positioning part” col. 11, last paragraph) opening onto said first surface of said one-piece substrate **31A, 41, 42** and configured to at least partially contain said contact portion **63** of said spring contact **63**; and

a retaining portion **46, 70** (Figs. 16, 24A-24C) having a first end connected to an opposing end of said seat portion **53A** (Fig. 14B) and a second end **46, 70** extending said depth into said one-piece substrate **31A, 41, 42** and configured to receive and electrically connect the base portion **71, 72, 73** of the spring contact **63**, to the conductive trace **48** (Fig. 16).

If it is thought that **Haseyama-1** does not provide a “one-piece substrate” since the items **31A, 41** and **42** are labeled differently, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces, would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”) In the instant case, it would be obvious to form the **Haseyama-1** substrate **31A, 41, 42** integrally, because the parts of the substrate are shown in direct contact with each other in, for example, the **Haseyama-1** Fig. 9. Moreover, Fig. 14B

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shows that the seat portion and retaining portion of the aperture can be integrally formed. Fig. 15 shows that the items **31A**, **41**, and **42** form a “one-piece substrate.”

Regarding claims 11 and 15, a layer of conductive material **46** (Fig. 16), **70** (Figs. 24A-24C) or a volume of conductive filler **30** (Fig. 11; col. 10, lines 64-67), **70** (Figs. 24A-24C) is disposed on the interior wall of the aperture **44**, **70** and is therefore necessarily “in” the aperture and electrically connects the base portion **71**, **72**, **73** of the spring contact **63** to said conductive trace **48** (Fig. 16). Further regarding claim 15, it is noted that the claim does not limit from where the depth begins and ends. As shown in Hasegawa --as in Applicant’s Fig. 6, for example-- the depth is from the wall of the aperture inward.

Regarding claims 12, 14, 16, and 18, the conductive filler material **46**, **70** is electrically connected to conductive traces **48** (Fig. 16) formed on said one surface and the opposing surface of said substrate **42**. Further regarding claims 14 and 18, the retaining portion **46** of the aperture **44** may open onto the opposing surface **42** of the one-piece substrate (Fig. 16).

Regarding claim 20, the second end of said retaining portion **46**, **70**, opens onto an opposing surface of said substrate **42**, **32** as shown in Figs. 16, 24A-24C.

Regarding claim 21, the seat portion may be conically shaped (Fig. 11), hemispherically shaped (Fig. 9) or cylindrically shaped (Fig. 14B).

Regarding claim 22, the seat portion **38** (or **53A**) is configured to at least partially align said lead element **28** of said IC device **25**, as noted above.

9. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama-1** in view of Patent Application Publication US 2002/0075025 A1 (**Tanaka**).



The prior art of **Haseyama-1**, as explained above, discloses each of the claimed features except for indicating that the substrate has an “intermediate conductive plane,” which Examiner interprets to be exemplary shown in the instant Fig. 11, item **669**.

**Tanaka**, like **Haseyama-1**, teaches a semiconductor testing tool, and provides an “intermediate conductive plane,” (called “internal lead wires 8” in the Abstract), electrically connected to the conductive layer or conductive filler **7**, which beneficially reduces the number of structural elements of the test tool.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to include “intermediate conductive plane,” as taught by **Tanaka**, in the substrate of **Haseyama-1** to beneficially reduce the number of structural elements, by providing embedded elements, as expressly taught by **Tanaka**.

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama-1** in view of JP 2000-123935 (**Kawaguchi**).

The prior art of **Haseyama-1**, as explained above, discloses each of the claimed features except for indicating that the coil spring has at least two coils for contacting the lead elements.

**Kawaguchi** teaches a similar integrated circuit test tool to **Haseyama-1** wherein coil springs **20** (Figs 1 and 2) are used to make electrical contact to the lead elements **11** (solder bumps or conductive balls) of an integrated circuit **10**, and states in pertinent part (in the machine language translation) “this invention aims at offer of the contact pin which does not start the defective continuity by the poor contact, and the socket using this contact pin, without generating damage, when ... a conductive ball is contacted” (paragraph [0006] ) and in solving the problem

provides a contact pin having a contact section, “of the shape of a spiral by two or more number-of-turns sections of a coiled spring edge.”

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use two or more coil turns as taught by **Kawaguchi** in the spring contact portion of **Haseyama-1** to prevent damage and provide better contact with the solder bumps, as expressly taught by **Kawaguchi**.

11. Claims 9, 10, 13, and 15-17 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent Application Publication 2002/0060579 A1 (Haseyama et al.; **Haseyama-2**, hereafter).

Regarding claim 9, **Haseyama-2** discloses a device for establishing electrical contact between a lead element **31** extending from an integrated circuit **30** comprising,

a one-piece substrate **20, 24** (Fig.5A), bounded by a first “substantially planar” surface and an opposing second “substantially planar” surface and having at least one conductive trace **25** (Fig. 5B) configured for operably connecting said IC device **30** to at least one electrical component **26** mounted on said one-piece substrate;

a spring contact (Figs. 4A-4F) including a base portion and a contact portion, said contact portion comprising a resiliently compressible coil spring **12** configured to bias against and electrically contact said lead element **31** of said integrated circuit device **30**; and

an aperture **21** opening onto one surface of said one-piece substrate and extending a depth at least partially into said one-piece substrate (Figs. 5A-5B), said aperture **21** configured to receive and electrically contact said base portion of said spring contact,

wherein the aperture **21** includes

a seat portion (Fig. 5B) opening onto said first surface of said one-piece substrate **20, 24** and configured to at least partially contain said contact portion of said spring contact (Figs. 4A-4F); and

a retaining portion (Fig. 5B) having a first end connected to an opposing end of said seat portion and a second end extending said depth into said one-piece substrate **20, 24** and configured to receive and electrically connect the base portion of the spring contact, to the conductive trace **25** (Figs. 5A-5B).

If it is thought that **Haseyama-2** does not provide a “one-piece substrate” since the items **20, 24** are labeled differently and shown bolted together in Fig. 5A, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces, would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”) In the instant case, it would be obvious to form the **Haseyama-2** substrate integrally, because the items **20** and **24** of the substrate are shown bolted together in Fig. 5A to form a one-piece substrate.

Regarding claim 10, the second end of said retaining portion does not extend through the one-piece substrate **20, 24** to said opposing, “substantially planar” second surface. The opening

ends at the end of **20** but does not go through **24**. Note that **24** is called a “substrate” at paragraph [0037].

Regarding claim 15, item **25** in Fig. 5B, is shown to be a volume of conductive filler material disposed in and filling at least a partial depth of said aperture **21**, and electrically contacting said base portion of said spring contact.

Regarding claim 16, the conductive filler **25** connects to the at least one conductive trace **26**.

Regarding claims 13 and 17, item **26** is a conductive trace formed at an intermediate plane in the one-piece substrate **20, 24**.

### ***Response to Arguments***

12. Applicant's arguments filed 22 July 2003 (Paper no. 20) have been fully considered but they are not persuasive.

Applicant's argument regarding alleged support for the limitation “substantially planar” are noted. The are not considered persuasive for reasons indicated above and are included here in their entirety.

Applicant's arguments with respect to claims 9-18 and 20-23 have been considered but are moot in view of the new ground(s) of rejection. Examiner has pointed to different embodiments and no longer has indicated that the test board 32 in **Haseyama-1** is part of the substrate. For reasons indicated above, it is believed that the one-piece construction of the substrate is anticipated or at least obvious over **Haseyama-1**.

The remaining arguments are based upon the alleged failure of Haseyama-1 to disclose a one-piece substrate. These are not persuasive for reasons indicated above in the rejection.

### *Conclusion*

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Erik Kielin

Primary Examiner

October 4, 2003